

REMARKS

Claims 1-3, 5, 6 and 8-15 are pending. Claims 4 and 7 have been canceled.

Claim 1 was amended to define the type of crosslinking agent. The feature defining the crosslinking agent is supported by page 23, lines 7 to 9 of the present specification. Claim 1 was further amended to add a feature, "capable of forming a positive pattern resin film ". This is supported by whole of the present specification, particularly by page 22, lines 12 and Example 1 of the present specification.

Claim 10 was amended in a similar sense as Claim 1 set forth above and further by introducing a feature of post baking the resin film formed of the resin composition. The feature of post baking the resin film formed of the resin composition is supported by page 29, lines 21 to 22 and Example 1 of the present specification.

New Claims 16 and 20 are supported by page 22, lines 9 to 11.

New Claims 17 to 23 are supported by page 22, lines 13 to 24 of the present specification.

New Claim 24 is supported in the sense set forth above with respect to Claim 10.

No new matter has been added by way of the above-amendment.

Issues under 35 U.S.C. § 103(a)

Claims 1-15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Jayaraman et al. (U.S. Patent 6,147,177) in view of Tsunogae et al. (U.S. Patent 6,486,264). Applicants respectfully traverse the rejection.

In the previous Office Action dated June 15, 2007, the Examiner applied Jayaraman et al. against the inventive claims. The Examiner has newly applied Tsunogae et al. in the above-mentioned rejection. Based on the Examiner's comments at the first full paragraph from page 5 of the

outstanding Office Action, the Examiner is relying upon Tsunogae et al. for teaching that the organoruthenium compound includes a neutral electron donating ligand.

Applicants respectfully submit that the presently claimed invention is not made obvious by the combination of Jayaraman et al. and Tsunogae et al.

Inventive claim 1 recites a radiation sensitive resin composition having the following features:

- i) The radiation sensitive resin composition is capable of forming a positive pattern resin film
- ii) The radiation sensitive resin composition comprises
 - (A) An alicyclic olefin resin soluble in an alkali,
Which is a ring-opening polymer having an acidic group which is obtained by ring-opening polymerization of a polymerizable monomer comprising an alicyclic olefin monomer having an acidic group in a presence of a catalyst comprising ruthenium (is a catalyst comprising as a main component an organoruthenium compound in which a neutral electron-donating ligand is coordinated), followed by hydrogenating an obtained polymer,
 - (B) An acid-generating agent,
 - (C) A crosslinking agent which is a compound capable of forming a crosslinked structure between molecules of the crosslinking agent by heating, and
 - (D) A solvent.

As noted above, claim 1 was amended by adding a feature that the resin composition is capable of forming a resin film of a pattern of positive type. Further, the crosslinking agent is defined as a compound capable of forming a crosslinked structure between molecules of the crosslinking agent by heating.

Jayaraman et al. disclose the use of positive and negative tone photoresist compositions, see abstract. Jayaraman et al. also suggest the use of a crosslinking agent, however, there is no teaching or suggestion by Jayaraman et al. to use a crosslinking agent *in combination with* a positive resist composition as presently claimed. Jayaraman et al. teach that the crosslinking agent is exclusively used in the negative resist composition. This is shown in column 19, line 55 to column 20, line 9 of Jayaraman et al. which is as follows:

The polymers of the invention are suitable for use in positive and negative tone photoresist compositions. The positive tone photoresist compositions of the present invention comprise the disclosed polycyclic compositions, a solvent, and an photosensitive acid generator (photoinitiator). In addition to the foregoing components, the negative tone photoresist compositions of the invention include a crosslinking agent. The polymers suitable for use in the negative tone resist compositions of the invention comprise repeating units derived from monomers set forth under Formula I that contain a hydroxyl substituted aromatic group, preferably phenols. These polymers preferably contain from about 5 to about 95 mole percent of repeating units having pendant hydroxyl substituted aromatic groups, more preferably from about 10 to about 60 mole percent, and most preferably from about 15 to about 40 mole percent. The crosslinking agent is a compound which is capable of reacting with the hydroxyl groups on the pendant aromatic moieties on the polymer backbone. The crosslinking agent is activated in the presence of an acid, e.g. the acid generated by the photoacid generators described below. (Emphasis added).

As shown in the above-cited passage, Jayaraman et al. teach that the crosslinking agent is exclusively used in the negative tone photoresist compositions. Jayaraman et al. fail to teach or suggest to use crosslinking agent for a positive tone photoresist composition, as presently claimed.

The fact that Jayaraman et al. exclusively use the crosslinking agent in the negative tone photoresist compositions is further supported by the examples of Jayaraman et al. Jayaraman et al. disclose a positive resist in Example 5. However, no crosslinking agent is used in the Example. As such there is no explicit or implicit teaching by Jayaraman et al. to use a crosslinking agent in a positive tone photoresist composition.

Furthermore, the artisan would have no reason to modify the teachings of Jayaraman et al. to include a crosslinking agent in the positive resist compositions, since conventional positive

resists are designed so that insoluble portions of the resist are made soluble by irradiation with light. In contrast to Jayaraman et al., a crosslinking agent (component C) is essential even in a positive resin film of a pattern of positive type in the present invention. By using a crosslinking agent in the resin composition, the heat resistance of the resin pattern film formed of the resin composition can be improved in the post-baking step (please see page 29, lines 21 to 24 of the present specification).

As such, significant patentable distinctions exist between the present invention and the teachings of Jayaraman et al.

The Examiner cites Tsunogae et al. for teaching a catalyst comprising ruthenium is a catalyst comprising as a main component an organoruthenium compound in which a neutral electron-donating ligand is coordinated. Tsunogae et al. disclose a process for producing a hydrogenated product of a polymer prepared through ring-opening polymerization which comprises a polymerization step of polymerizing a cyclic olefin through ring-opening polymerization in the presence of a polymerization catalyst comprising an organoruthenium compound to prepare a polymer, and a hydrogenation step of adding a hydrogenation catalyst and hydrogen into a polymerization system resulting from the polymerization step to hydrogenate the carbon-carbon double bonds of the polymer prepared through the ring-opening polymerization (ABSTRACT of Tsunogae et al.). However, Tsunogae et al. fail to teach or suggest that the resin composition comprising the hydrogenated product of a polymer prepared through ring-opening polymerization contains a crosslinking agent which is a compound capable of forming a crosslinked structure between molecules of the crosslinking agent by heating and also that the resin composition is capable of forming a resin film of a pattern of positive type.

Despite the fact that there is no reason for the artisan to look to the teachings of Tsunogae et al. to modify the teachings of Jayaraman et al., Tsunogae et al. fail to cure the deficiencies of Jayaraman et al. As such, even if the teachings of Jayaraman et al. and Tsunogae et al. are combined, no one of ordinary skill in the art can arrive at the presently claimed invention.

Furthermore, claims 2-3, 5-6 and 16-19 which directly or indirectly depend on Claim 1 are considered to be allowable for the reasons set forth above. With respect to process claims 10 to 15 and 20 to 23, these process claims are considered to be allowable by applying same argument set forth above. Claims 8-9 and 24 which are directed to a resin film formed by a process of Claim 10 are also considered to be allowable.

Based on the foregoing, withdrawal of the rejection is respectfully requested.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Conclusion


In view of the above remarks, it is believed that claims are allowable.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Garth M. Dahlen, Ph.D., Esq., Reg. No. 43,575 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

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